Enough Room?

Reporting Category	Computation and Estimation
Topic	Solving problems involving addition and subtraction with fractions and mixed numbers

Materials

- One-inch grid paper
- Colored tiles
- Enough Room? recording sheet (attached)

Vocabulary

fraction, mixed number, simplest form

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Distribute grid paper and colored tiles. Have students use the tiles to create all possible rectangles with an area of 12 and record each rectangle on grid paper. They should draw each rectangle in multiple ways.
2. Have students use colored tiles to show several different fractional parts by coloring the rectangles on the grid paper. Color $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{12}$ in each of the rectangles using a different colors for each. Next ask them to outline and label $\frac{2}{3}$, $\frac{2}{4}$, $\frac{2}{6}$, etc.
3. Have students share some of their fractional parts and discuss, as a class, how the fractional parts look on the grid.
4. Distribute copies of the Enough Room? recording sheet (attached), and have students complete them, working individually or in pairs.

Assessment

- **Questions**
  - What are some other situations in which you need to add and subtract fractions?
  - What happens to fractions when they equal more than one? What are some examples of fractions that are equal to more than one, and what are different ways of expressing them?
- **Journal/Writing Prompts**
  - Explain how you would arrange the furniture in the two rooms on the Enough Room? recording sheet (attached).
  - Explain what must be true about the denominators of two fractions in order for you to add or subtract them.

- Write a story about someone adding and subtracting fractions.

- **Other**
  - Scott and Megan ordered two pizzas. They were each cut into 10 equal pieces. Megan ate $\frac{3}{5}$ of one of the pizzas and Scott ate $\frac{7}{10}$ of the other pizza. Draw a picture to find out how much pizza is left after they finished eating.

Extensions and Connections (for all students)

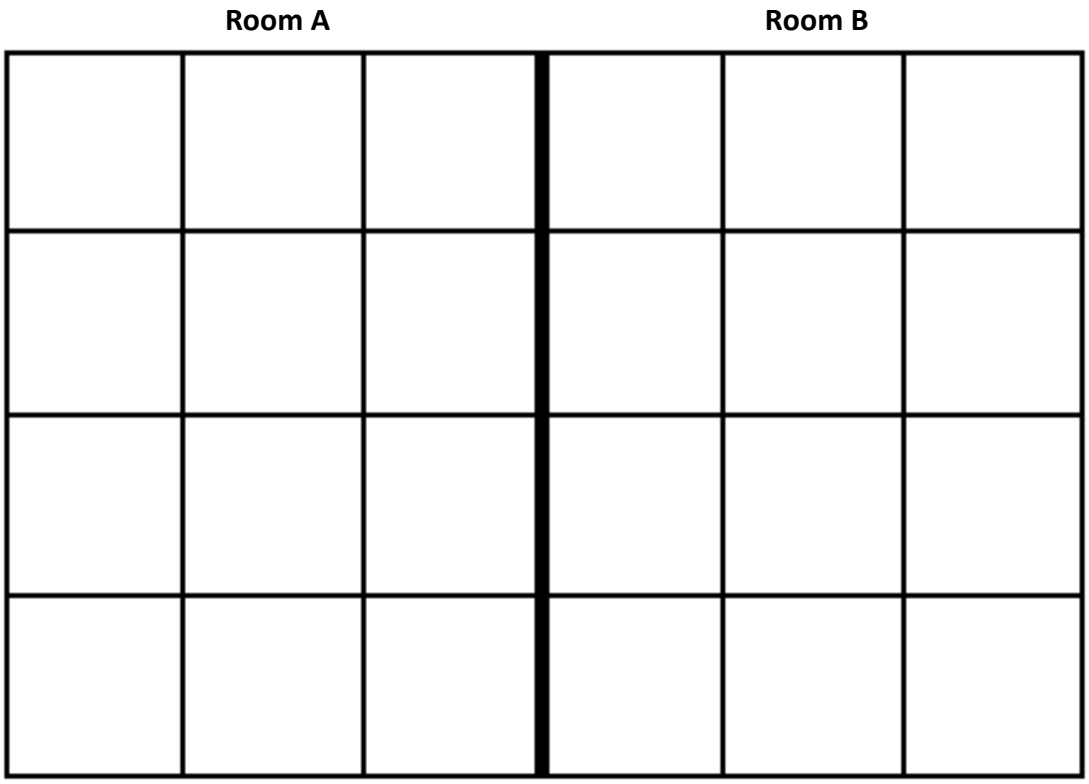
- Tell the students that you want to make a border for a bulletin board in the classroom using ribbon. Have each student bring in a piece of ribbon. Have students use a meter as the unit for measuring. For example, the length of ribbon might be $\frac{1}{2}$ meter or $\frac{7}{10}$ meter. Have students measure the bulletin board and figure out by adding the pieces of ribbon to see whether they have enough to complete the border. If they have enough to go around once, have them add to determine whether they have enough ribbon to go around the border more than once and/or how much ribbon is left over.
- John and Sharon added another room the same size as the Enough Room? activity sheet's room A for a playroom for their children. What furniture and toys would fit in the room and what are their fractional parts?

Strategies for Differentiation

- Make it a smaller problem by using one room with 12 squares.

Enough Room?

Name _____ **Date** _____



John and Sharon moved into a new home, but the upstairs bedrooms were too small. Each of the rooms had only twelve square units, as in the picture above, so they decided to put an opening between the two rooms. The bed that they brought takes up $\frac{1}{2}$ of room A. The nightstand is equal to $\frac{1}{12}$ of room A. A mirrored dresser takes $\frac{1}{4}$ of room B. Another dresser is equal to $\frac{1}{6}$ of room B. They also bought a rug that takes up $\frac{1}{4}$ of the floor space for one of the rooms.

Label the furniture in the grid above.

1. How much of both rooms will be taken up with furniture and rug when they move in?

2. Sharon wants to have a closet built into room B. It will take up $\frac{1}{3}$ of room B. How much room will be left after that?

3. Can the furniture be arranged in more than one way? The couple inherited another piece of furniture; what size does it have to be to fit? (Remember to leave room to walk.)